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Date: **July 20, 2012**

To: **Amy Wolff, Durham City County Planning Department**
From: **Bill Judge PE, City of Durham Department of Transportation**
Subject: **Palladian Apartments (Z1200010) Traffic Impact Analysis**

The Unified Development Ordinance (UDO) requires that a Traffic Impact Analysis (TIA) be prepared for proposed developments estimated to generate 150 or more peak-hour vehicle trips. The proposed Palladian Apartments development includes 310 apartment units. The development is expected to generate 2,002 daily trips with 156 a.m. peak-hour trips (31 entering and 125 exiting) and 188 p.m. peak-hour trips (122 entering and 66 exiting). The proposed development is located on the east side of Leigh Farm Road north of NC 54. The expected completion year is 2013, and the TIA analysis year is 2014. The Palladian Apartments TIA was prepared by Kimley-Horn and Associates, Inc. in March 2012 with a supplemental analysis in April 2012 and July 2012.

Study Area
The study area includes the following intersections:

- NC 54 and Leigh Farm Road / Quadrangle Drive;
- NC 54 and I-40 Westbound Ramp; and
- NC 54 and I-40 Eastbound Ramps.

Trip Generation
Trip generation numbers are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 8th *Edition*, 2008. By utilizing Land Use Code 220 (apartments), the site is expected to generate 2,002 daily trips with 156 a.m. peak-hour trips (31 entering and 125 exiting) and 188 p.m. peak-hour trips (122 entering and 66 exiting).

Traffic Data Collection
The peak-hour intersection turning movement counts were taken from 7-9 a.m. and 4-6 p.m. in October 2011 and March 2012.

Trip Distribution and Assignment
The assignment of site traffic on the study area roadway network was based on the following trip distribution percentages:

- To/From the Southwest via NC 54: 30% of site trips;
- To/From the Northeast via NC 54: 30% of site trips;
- To/From the Northwest via I-40: 10% of site trips; and
- To/From the Southeast via I-40: 30% of site trips.

Approved Developments and Background Growth
There are no approved projects in the vicinity. A uniform annual compounded growth rate of 3% was utilized to determine the background traffic projections. A supplemental analysis was required to analyze the cumulative impact of the proposed site and the Carolina Crossing II development (Z1200004) proposed at the southwest corner of Farrington Road and Cleora Drive.

TIP Roadway Improvements
There are no scheduled City of Durham or NCDOT roadway improvement projects in the area. The draft *NC 54-I40 Corridor Study* proposes multiple roadway, transit, pedestrian, and bicycle related improvements in this area. This study was adopted by the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC-MPO) Technical Advisory Committee (TAC) in May 2012.

Capacity Analysis
Capacity analyses were performed using the a.m. and p.m. peak-hour for the following scenarios:

- Existing (2012) conditions;
- No-Build (2014) conditions (2012 existing + background growth);
- Build (2014) conditions (2012 existing + background growth + site traffic); and
- Build (2014) with pending development conditions (2012 existing + background growth + site traffic + pending development traffic).

This development is located within a Suburban Tier where the adopted LOS standard is LOS D. The following table summarizes the average delay for the various Levels of Service (LOS) for unsignalized and signalized intersections:

	Signalized Intersections	**Unsignalized Intersections**
Level of Service	**Average Vehicle Delay (Seconds)**	**Average Vehicle Delay (Seconds)**
A	**0-10**	**0-10**
B	**10-20**	**10-15**
C	**20-35**	**15-25**
D	**35-55**	**25-35**
E	**55-80**	**35-50**
F	**>80**	**>50**

NC 54 and Leigh Farm Road / Quadrangle Drive

The following table summarizes the Levels of Service at this existing signalized intersection:

Scenario	**a.m. LOS**	**p.m. LOS**
Existing (2012)	**A**	**B**
No-Build (2014)	**A**	**B**
Build (2014)	**B**	**C**

The intersection currently operates at a LOS A in the a.m. peak-hour and a LOS B in the p.m. peak-hour. With the additional site traffic, the delays will increase slightly, but the intersection will remain at an acceptable LOS C or better for both peak hours. No roadway improvements are required to address the site traffic impacts.

NC 54 and I-40 Westbound Ramp

The following table summarizes the Levels of Service at this existing signalized intersection:

Scenario	a.m. LOS	p.m. LOS
Existing (2012)	**B**	**A**
No-Build (2014)	**B**	**A**
Build (2014)	**C**	**A**

The intersection currently operates at a LOS B in the a.m. peak-hour and a LOS A in the p.m. peak-hour. With the additional site traffic, the delays will increase slightly, but the intersection will remain at an acceptable LOS C or better for both peak hours. No roadway improvements are required to address the site traffic impacts.

NC 54 and I-40 Eastbound Ramps

The following table summarizes the Levels of Service at this existing signalized intersection:

Scenario	a.m. LOS	p.m. LOS
Existing (2012)	**B**	**C**
No-Build (2014)	**B**	**C**
Build (2014)	**C**	**C**

The intersection currently operates at a LOS B in the a.m. peak-hour and a LOS C in the p.m. peak-hour. With the additional site traffic, the delays will increase slightly, but the intersection will remain at an acceptable LOS C or better for both peak hours. No roadway improvements are required to address the site traffic impacts.

Summary of TIA Required Improvements

No roadway improvements are proposed or required within the study area to accommodate the additional site traffic.